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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,232	12/21/2001	Ghulam Hasnain	10001379-1	8798

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AGILENT TECHNOLOGIES, INC.  
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Intellectual Property Administration  
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EXAMINER

MONBLEAU, DAVIENNE N

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/026,232

Applicant(s)

HASNAIN ET AL.

Examiner

Davienne Monbleau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 3-6 and 9-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-6 and 11 is/are rejected.
- 7) ☒ Claim(s) 9 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Response to Amendment***

The amendment filed on 9/22/03 has been entered. Claims 1, 2, 7, and 8 are canceled. Claims 3, 4, 6, 9 and 11 have been amended. Claims 3-6 and 9-11 are pending.

### ***Claim Objections***

Claim 3, line 8: the word "semiconducting" should be changed to -- semiconductor --.

Claim 11, 9: there is no antecedent basis for "said substrate".

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3-6 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the structural relationship between the active layer and the n-p junction. Since multiple types of layers are claimed, it is essential that the order of the layers is included to clearly define the invention.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ibbetson et al. (US 6,515,313) in view of Tan et al. (US 6,369,403). Ibbetson et al. teach in Figure 9A an optical semiconductor device comprising a plurality of semiconductor layers including a n-p junction between an n-type layer (86) and a p-type layer (84), an active layer (85) and a substrate (81). Ibbetson et al. teach in Figure 8B that said active layer is grown on a base layer (81) such that the polarization field is directed from said n-layer to said p-layer. Lastly, Ibbetson et al. teach in Figure 10A that n-type base layer (111) can be grown on the substrate. Ibbetson et al. do not teach a reverse biased tunnel diode between said active layer and said n-type base layer. Tan et al. (US 5,892,784) teach in Figure 2A a semiconductor optical device comprising a reversed-biased tunnel diode (216) between and active layer (204) and a n-type base layer (224). It would have been obvious to one of ordinary skill in the art at the time of the invention to include a reversed-biased tunnel diode Ibbetson et al., as taught by Tan et al., to provide a planar device structure which increases laser device reliability (see Tan et al. column 2 lines 34-42).

Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ibbetson et al. (US 6,515,313) in view of Yamada (US 5,693,965). Regarding both claims 6 and 11,

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Ibbetson et al. teach in Figure 9A an optical semiconductor device comprising a plurality of semiconductor layers including a n-p junction between an n-type layer (86) and a p-type layer (84), an active layer (85) and a substrate (81). Ibbetson et al. teach in Figure 8B that said active layer is grown such that the polarization field is directed from said n-layer to said p-layer.

Ibbetson et al. do not teach that a tilted active layer. Yamada teaches in Figure 4 a semiconductor optical device comprising a tilted active layer (302C) with a planar substrate (301). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a tilted active layer in Ibbetson et al., as taught by Yamada, to narrow the spot size of the emitted laser beam (see Yamada abstract).

***Allowable Subject Matter***

Claims 4-5 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding Claims 4-5, the prior art does not teach or fairly suggest an optical semiconductor device, along with the other claimed features, wherein said semiconductor layers are grown on an n-type GaN base layer having a reversed c-axis.

Claims 9-10 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding Claims 9-10, the prior art does not teach or fairly suggest a method for fabricating a semiconductor light emitting device comprising, along with the other claimed features, a base layer generated by growing a GaN seed layer having a top and bottom surface, said bottom surface being in contact with a substrate that causes said GaN layer to have a crystal

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orientation in the wurtzite c-axis direction, removing said seed layer from said substrate, and growing said base layer on said bottom surface of said seed layer.

The advantages of these features are in the specification on pages 1-3.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

Applicant's arguments with respect to Claims 4, 5, 9 and 10 have been carefully considered and found persuasive. In particular, regarding Claims 5 and 5, the Applicant argues on page 5 that the cited prior art of record fails to teach a GaN substrate with a reverse c-axis, which is defined in the specification as a "GaN substrate in which the nitrogen-face is exposed". Regarding Claims 9 and 10, the Applicant argues on page 7 that the cited prior art fails to teach a method in which layers are deposited on a GaN base layer that was removed from a substrate with turning over the GaN base layer.

Applicant's arguments with respect to claims 3, 6 and 11 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 703-306-5803. The examiner can normally be reached on Mon-Fri 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 703-308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

*Davienne Monbleau*  
DNM

  
DAVID PORTA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800